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MAPPING OF RESEARCH TEST-POINT AREAS ON THE SHROUD OF TURIN

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ABSTRACT

During the October 1978 scientific examination of the Shroud of Turin, researchers used a system of magnets to mark and identify the specific test-point locations of a variety of data-gathering experiments performed on the Shroud. This prevented damage to the cloth and allowed for photographic documentation at the completion of each experiment. This paper reviews the marking system and the techniques used to produce the documentary photographs, lists the type and description of each test-point and describes the production of the final test-point maps, which are included to permit location of the exact data-points upon which project results are based.

INTRODUCTION

The Shroud of Turin Research Project, Inc., was given five days and nights to perform non-destructive analysis on the controversial, image-bearing linen cloth. The purpose of the testing was to gather data that could determine the image formation process and explain the nature and physical properties of the image on the Shroud. Data was collected from all image components on the Shroud by each experiment performed, and included sampling from body image areas, apparent blood and serum stains, water stains, light and heavy scorch marks and non-image background areas for control purposes. Since data-sampling site positions were important for final analysis, a system was needed to accurately mark and document the numerous test-points for each experiment. Magnets were placed on the Shroud corresponding to each data-point and photography was used to record them for four of the experiments that sampled various areas of the cloth. Photographic maps were then produced to show the type and location of the test-points for each particular experiment.

MARKING SYSTEM

The non-destructive examination of the Shroud of Turin required mounting the cloth, with magnets, on a specially-designed stainless steel support table. This also allowed researchers to accurately indicate actual test point areas by placing 0.25 inch diameter magnets at the exact spot where data was taken. Certain important examination points were preselected and numbered as part of the project's original test plan (1). In some cases, magnets were physically labeled with these numbers for ease in later identification, but in all cases, researchers used these numbers for reference in their test notes. Additional X-Y number and letter coordinates were fixed to the support table peripheral frame for further visual reference.

Due to time constraints, several experiments proceeded simultaneously on different parts of the cloth. Tests were organized on a rotating basis during the 120 hours allowed for the examination and several test periods were normally required to complete each experiment. Magnets in place at the end of any given test period were documented and removed before the next test in that area began. Each final map is a composite made from all photographs taken to completely document that experiment.

PHOTO-DOCUMENTATION

At the completion of each phase, 35mm color slides were made that included close-ups for positive magnet identification and overall views of the magnetic markers that also showed visible image components and map coordinate numbers on the support table frame for data-point location accuracy. Audio tapes were then used to record detailed photographic information including test-point locations, descriptions and additional identifying data. Photographs were made separately for ventral and dorsal image areas of the Shroud to maximize final image size and resolution. Master black and white 4" X 5" negatives that included the visible map coordinate numbers on the support table frame were made without the magnets in place to provide the photographs upon which the maps were created.

MAPPING

The documentary slides were individually projected onto corresponding ventral or dorsal black and white 11" X 14" prints of the Shroud and support table, and landmark image components were visually superimposed and carefully registered. Acetate overlay sheets for each experiment were pin-registered over the prints and all test-points were marked and numbered in exact position on the appropriate overlay. The registered acetates were

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then rephotographed and a map for each experiment's data points, ventral and dorsal, was the result.

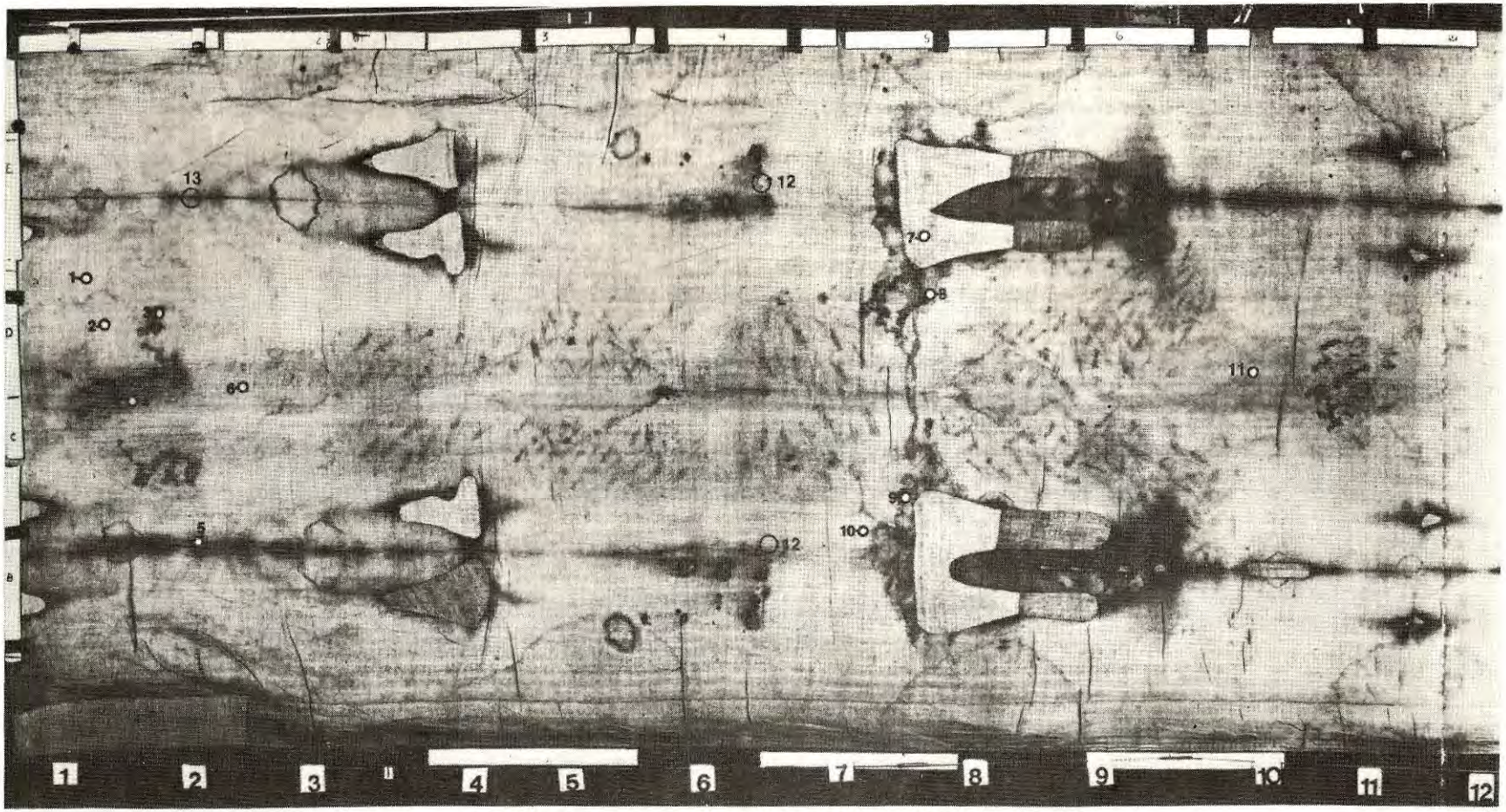
Identification of test points in the original test plan, and from preliminary visual examination of the Shroud itself, in some cases failed to determine an overlap of different image components (ie. scorch over blood or serum). Map key descriptions are based on preliminary determinations from the information tape recorded during photo-documentation, the preselected data-points from the original test plan and certain known test results. Consequently, the map keys indicate multiple labels for all pertinent test-points where that information was available. However, labels may be altered by some results papers when final evaluation has been completed. The map keys include data-point identification numbers, site descriptions, original test plan identification numbers and documentary slide file numbers for both overall and close-up views. In a few cases, time restraints prevented researchers from using the magnetic markers, or the markers were removed without photographic documentation. Wherever such undocumented samples occured, approximate test-points were indicated (by larger circles) on the corresponding maps and appropriate source references were listed in place of slide file numbers.

ACKNOWLEDGEMENT

The author gratefully acknowledges the efforts of Peter Lacker in the preparation of the acetate overlays, photocopying work and printing of the final test maps, and Thomas Ploch for making the master black and white prints.

REFERENCES

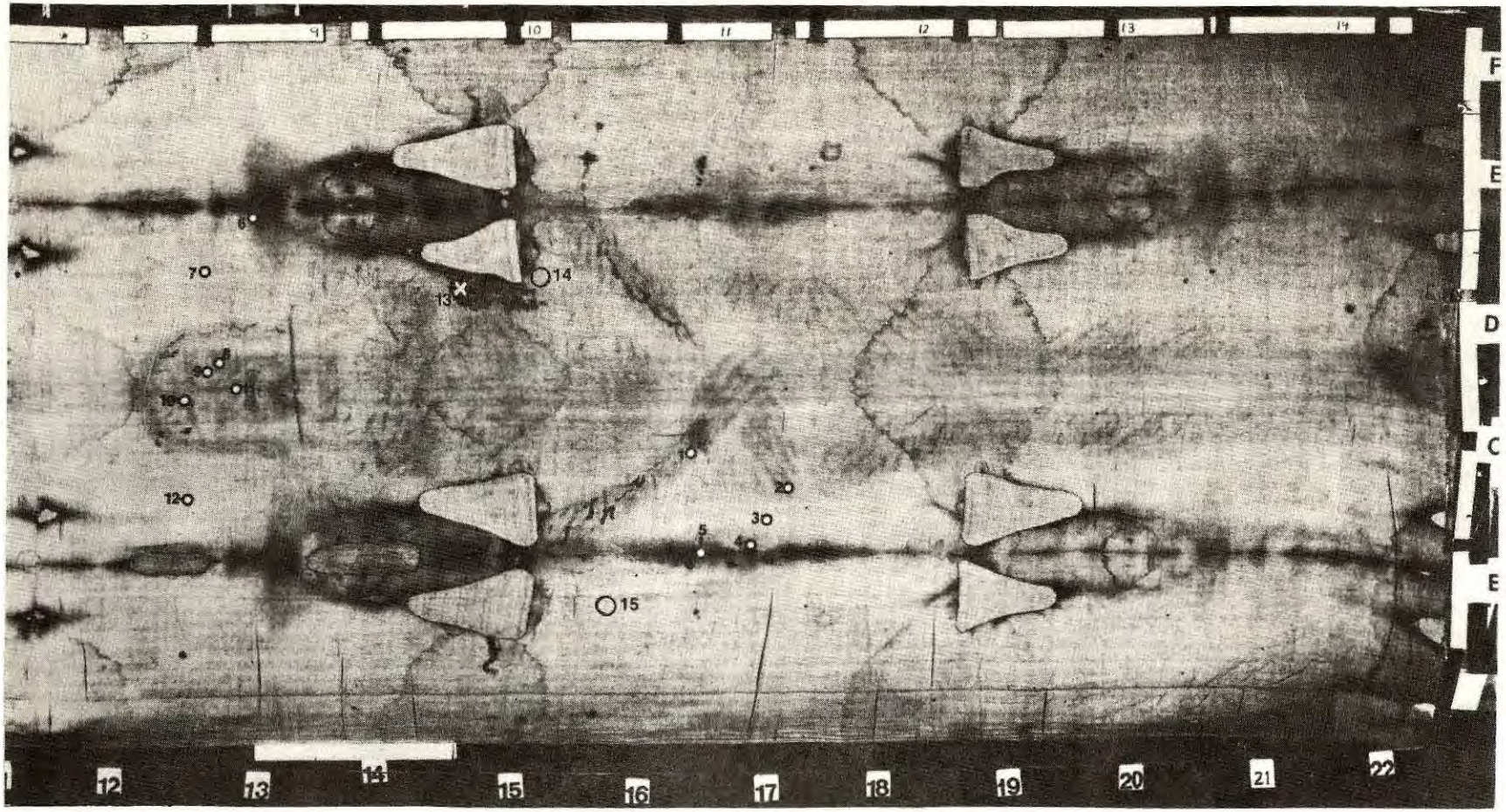
(1) The Shroud of Turin Research Project, Inc., "Operations Test Plan for Investigating the Shroud of Turin by Electromagnetic Radiation at Various Wavelengths," 1978, pp.7-15, Not Available.
(2) Gilbert, Roger,Jr. and Marion M. Gilbert, "Ultraviolet-Visible Reflectance and Flourescence Spectra of the Shroud of Turin," Applied Optics, Vol.19, No.12, 15 June 1980, pp.1930-1936.
(3) Schwalbe,L.A. and Rogers,R.N., "Physics and Chemistry of the Shroud of Turin, A Summary of the 1978 Investigation," Analytica Chimica Acta, No.135, 1982, pp.3-49.
(4) Heller, J.H. and A.D. Adler, "A Chemical Investigation of the Shroud of Turin," Can.Soc.Forens. Sci.J., Vol.14, No.3, 1981, pp.81-103.
(5) Heller, John H. and Alan D. Adler, "Blood On The Shroud of Turin," Applied Optics, Vol.19, No.16, 15 August 1980, pp.2742-2744.
(6) Accetta,J.S,and J.Stephen Baumgart, "Infrared Reflectance Spectroscopy and Thermographic Investigations of the Shroud of Turin," Applied Optics, Vol.19,No.12, 15June1980, pp.1921-1929.
(7) Pellicori, Samuel and Mark S. Evans, "The Shroud of Turin Through the Microscope," Archaeology, Jan.-Feb. 1981, pp.32-43.



ULTRAVIOLET-VISIBLE SPECTROSCOPY - DORSAL (2)

Map#	Description	Orig. Test Plan or (Rsrchr. Assgnd) ID#*	Slide File # Overall	C/U
1	Control	(1F)	8-B-2	8-B-4
2	Control Near Flow	1B	8-B-2	8-B-4
3	Blood Flow	1A	8-B-2	8-B-4
4	Image: Heel of Foot	1D	8-B-2	8-B-4
5	Scorch	1C	8-B-2	8-B-4
6	Image: Calf/Ankle (non-contact)	1E	8-B-2	8-B-4
7	Light Colored Patch	3D	8-B-8	8-C-1
8	Serum	3B	8-B-8	8-C-1
9	Blood	3C	8-B-8	8-C-1
10	Control	3A	8-B-8	8-C-1
11	Image: Neck/Hair	(6A)	8-C-3	8-C-7
12	Scorches (Approx. Test-Points)	(3E)	(2)	
13	Scorch (Approx. Test-Point)	(1C)	(2)	

*Some researchers have used an "F" or a "B" after these ID #'s to indicate "Frontal" (Ventral) or "Back" (Dorsal) sides of the Shroud. Researcher-assigned ID #'s are furnished for those data-points not preselected in the original test plan.



ULTRAVIOLET-VISIBLE SPECTROSCOPY - VENTRAL (2)

Map#	Description	Orig.Test Plan or (Rsrchr.Assgnd) ID#*	Slide File # Overall	C/U
1	Blood on Wrist	3E	7-F-2	7-E-10
2	Image: Middle Finger	3A	7-F-2	7-E-10
3	Control	3B	7-F-2	7-E-10
4	Light Scorch	3C	7-F-2	7-E-10
5	Dark Scorch	3D	7-F-2	7-E-10
6	Light Scorch	(3H)	8-C-10	8-D-3
7	Control	(8G)	8-C-10	8-D-3
8	Image: Right Cheek	8E	8-C-10	8-D-3
9	Image: Right Eye	8D	8-C-10	8-D-3
10	Blood: #3 Mark (Dark Area)	8C	8-C-10	8-D-3
11	Image: Tip of Nose	(8F)	8-C-10	8-D-3
12	Control	8A	8-C-10	8-D-3
13	Blood (Approx. Test-Point)	(6B)	(2)	
14	Control (Approx. Test-Point)	(6D)	(2)	
15	Control (Approx. Test-Point)	4	(2)	

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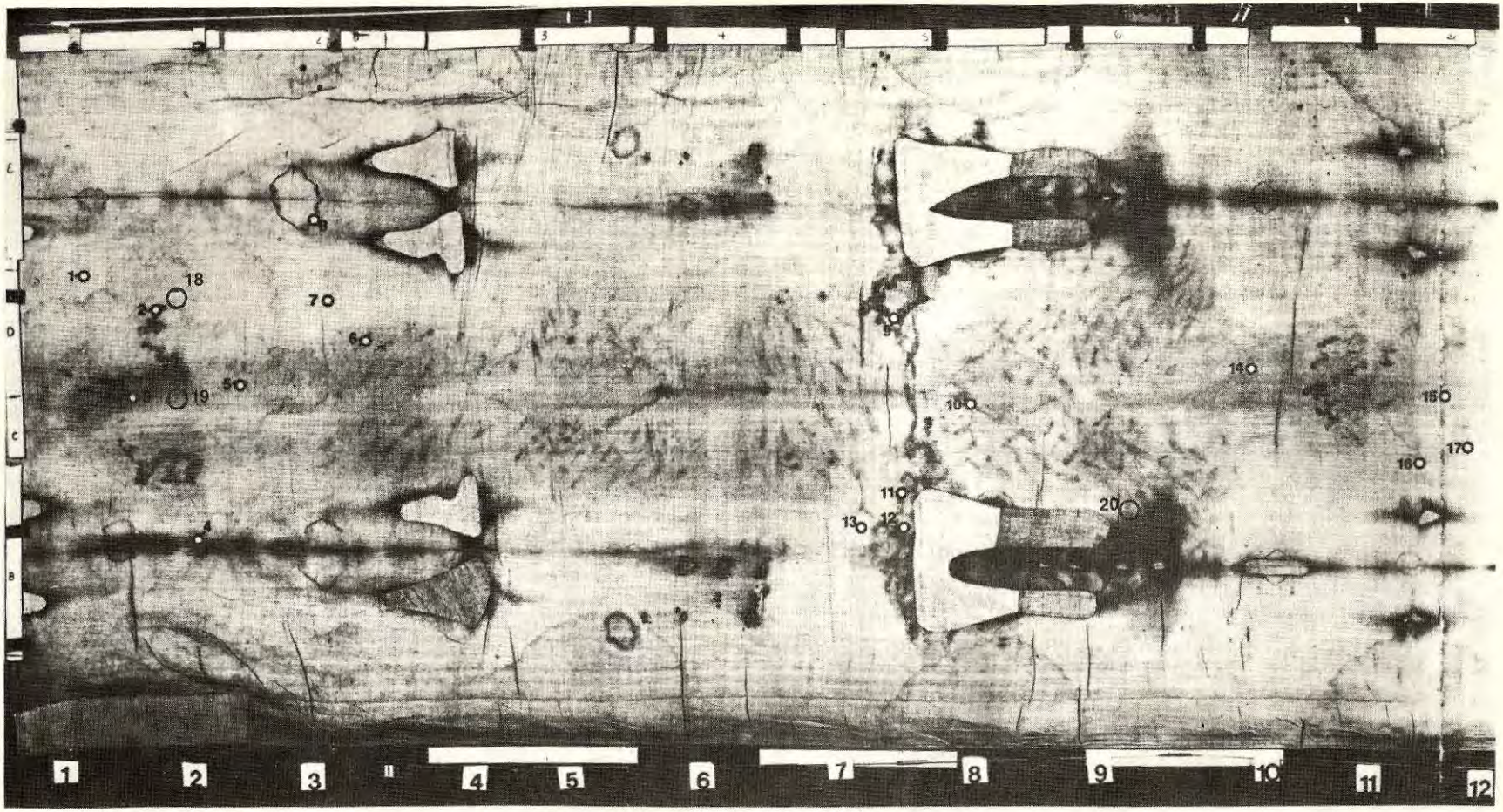

TAPE SAMPLES - DORSAL (3), (4), (5)

Map#	Description	Orig. Test Plan or (Rsrchr. Assgnd) ID#*	Slide File # Overall	C/U
1	Control	(1C)	8-B-2	8-B-4
2	Blood Flow	1A	8-B-2	8-B-4
3	Image: Foot	(1H)	8-B-2	8-B-4
4	Light Scorch	1C(1I)	8-B-2	8-B-4
5	Image: Calf/Ankle (non-contact)	1E	8-B-2	8-B-4
6	Image/Blood on Scourge Mark	(1F)	8-B-2	8-B-6
7	Control	(1G)	8-B-2	8-B-6
8	Watermark at Margin	(1J)	8-B-2	8-B-6
9	Blood	(3E)	8-B-8	8-C-1
10	Image/Watermark at Margin	(3F)	8-B-8	8-C-1
11	Blood	3C	8-B-8	8-C-1
12	Serum/Blood	3B	8-B-8	8-C-1
13	Control	3A	8-B-8	8-C-1
14	Image: Neck/Hair	(4E)	8-C-3	8-C-7
15	Control Inside Watermark	9A(F)	8-C-3	8-C-7
16	Control Outside Watermark	9B(F)	8-C-3	8-C-7
17	Watermark at Margin	9C(F)	8-C-3	8-C-7
18	Control (Approx. Test-Point)	(1B)	(Researcher's Test Notes)	
19	Heel of Foot (Approx. Test-Point)	(1D)	"	
20	Light Scorch (Approx. Test-Point)	(4C)	"	
NOTE:	Holland Cloth (NOT SHOWN)	(1B(H))	"	

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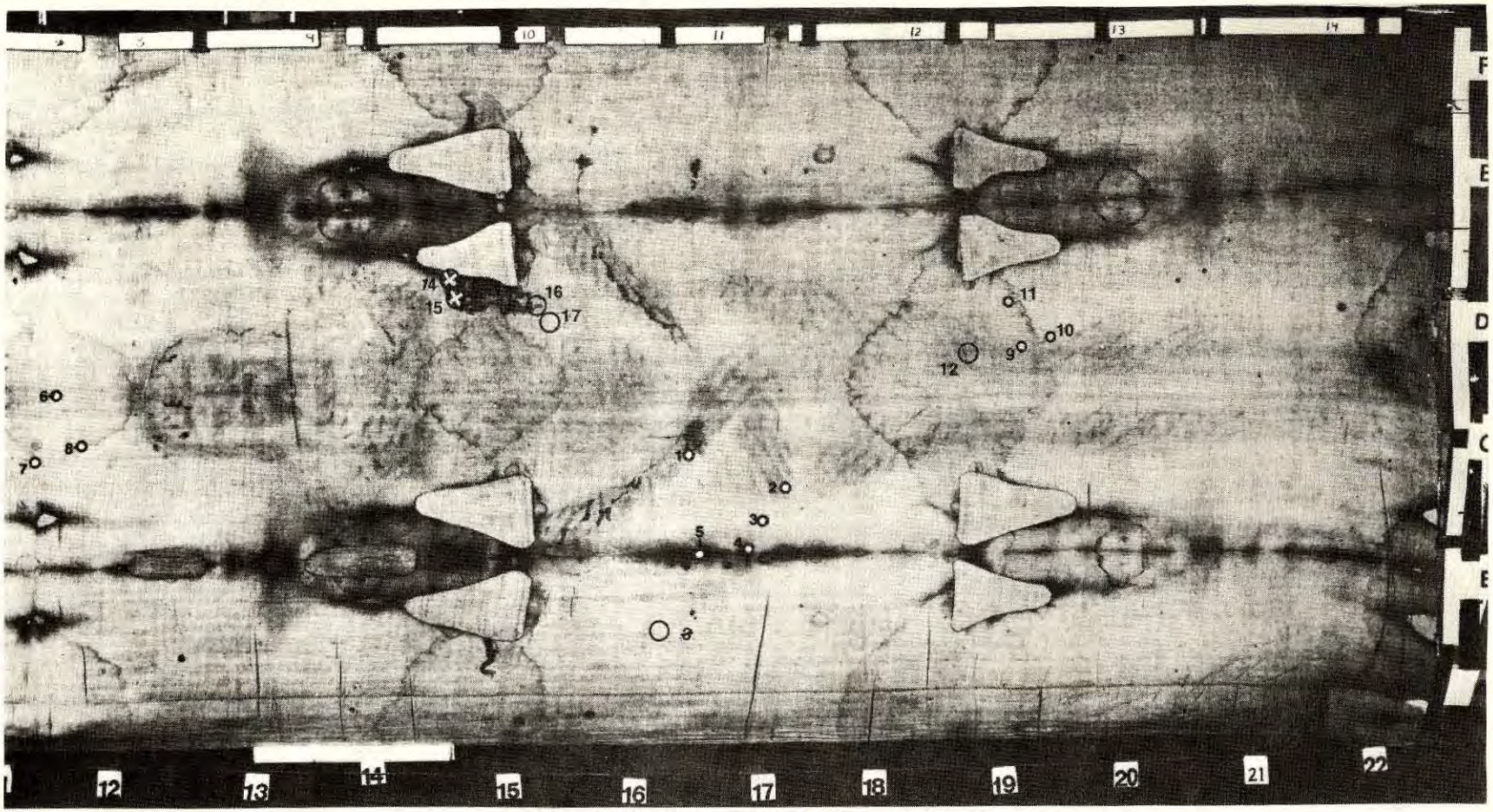

TAPE SAMPLES - VENTRAL (3), (4), (5)

Map#	Description	Orig.Test Plan or (Rsrchr.Assgnd) ID#*	Slide File # Overall	C/U
1	Blood on Wrist	3E	7-F-2	7-E-10
2	Image: Middle Finger	3A	7-F-2	7-E-10
3	Control	3B	7-F-2	7-E-10
4	Light Scorch	3C	7-F-2	7-E-10
5	Dark Scorch	3D	7-F-2	7-E-10
6	Control Inside Watermark	9A	8-A-3	8-A-5
7	Control Outside Watermark	9B	8-A-3	8-A-5
8	Watermark at Margin	9C	8-A-3	8-A-5
9	Image: Inside Watermark	(2B)	8-E-3	8-E-5
10	Image: Outside Watermark	(2)	8-E-3	8-E-5
11	Watermark at Margin	(2A)	8-E-3	8-E-5
12	Knee (Approx. Test-Point)	(2C)	(Researcher's Test Notes)	
13	Control (Approx. Test-Point)	(4)	"	
14	Blood/Scorch Intersection (Approx. Test-Point)	(6A)	"	
15	Blood Flow (Approx.Test-Point)	(6B)	"	
16	Tip of Blood Flow (Approx.T-P)	(6C)	"	
17	Control: Lt.Body Image (" ")	(6D)	"	

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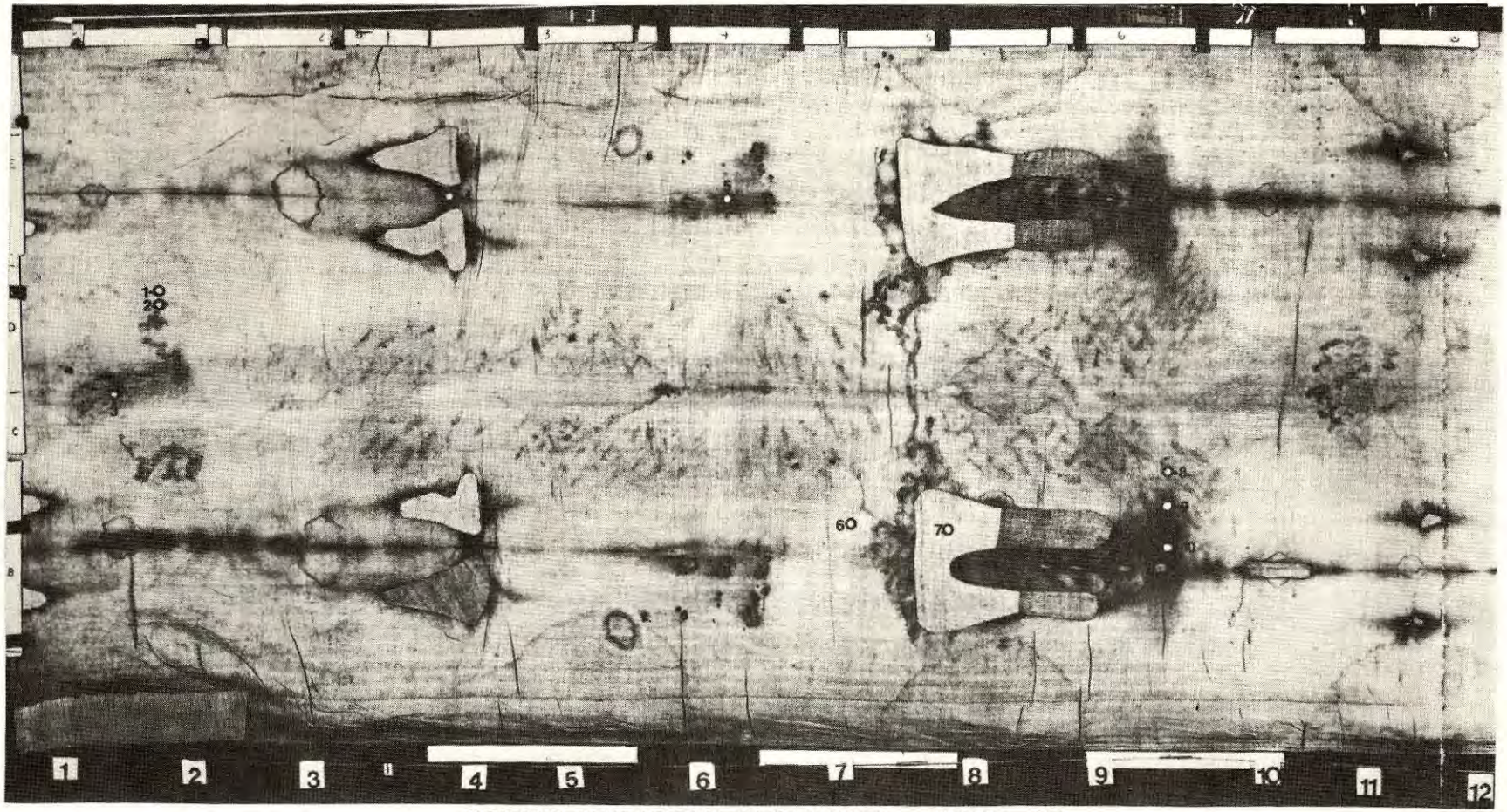

INFRARED REFLECTANCE SPECTROSCOPY - DORSAL (6)

Map#	Description	Orig.Test Plan or (Rsrchr.Assgnd) ID#*	Slide File # Overall	C/U
1	Control Near Flow	1B	7-F-5	7-F-3
2	Blood Flow	1A	7-F-5	7-F-3
3	Image: Heel of Foot	1D	7-F-5	7-F-3
4	Scorch	--	7-G-2	7-G-4
5	Holland Cloth Through Burn Hole	5	7-G-2	7-G-6
6	Control	(B7)	7-M-3	7-M-6
7	Light Colored Patch	3D	7-M-3	7-M-6
8	Image: Shoulder/Free of Blood	4D	7-M-3	7-M-8
9	Blood, Scorch, Image: Shoulder	--	7-M-3	7-M-8
10	Heavy Scorch, Image: Shoulder	--	7-M-3	7-M-8

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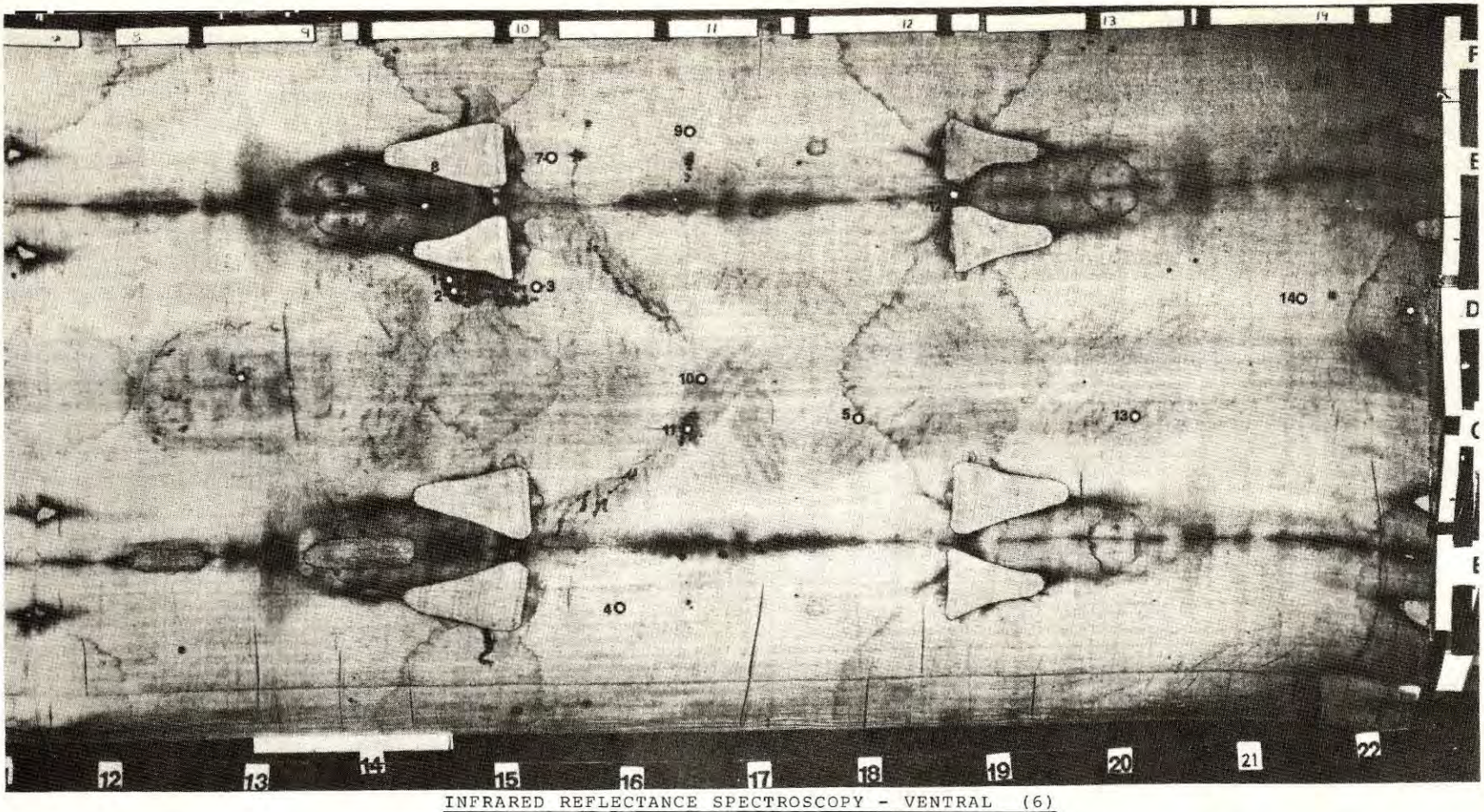

INFRARED REFLECTANCE SPECTROSCOPY - VENTRAL (6)

Map#	Description	Orig.Test Plan or (Rsrchr.Assgnd) ID#*	Slide File # Overall	C/U
1	Blood/Scorch Intersection	6A	7-G-9	7-H-1
2	Dark Blood, Image: Lance Entrance	6B	7-G-9	7-H-1
3	Control	6D	7-G-9	7-H-1
4	Control	4	7-H-3	7-H-4
5	Watermark Margin, Image: Thigh	2	7-H-3	7-H-8
6	Image: Nose/Moustache	--	8-C-10	8-D-3
7	Control	--	8-D-5	8-D-6
8	Dark Scorch	--	8-D-5	8-D-6

Map#	Description	Orig.Test Plan or (Rsrchr.Assgnd) ID#*	Slide File # Overall	C/U
1	Blood/Scorch Intersection	6A	8-D-5	8-D-6
9	Control	--	8-D-9	8-D-10
10	Image: Hand	--	8-D-9	8-D-10
11	Blood on Wrist	3E	8-D-9	8-D-10
12	Dark Scorch/Burn	--	8-E-3	8-E-5
13	Image: Knee, Blood	--	8-E-3	8-E-5
14	Control	--	8-E-7	8-E-9
15	Image: Foot, Blood Flow	--	8-E-7	8-E-9

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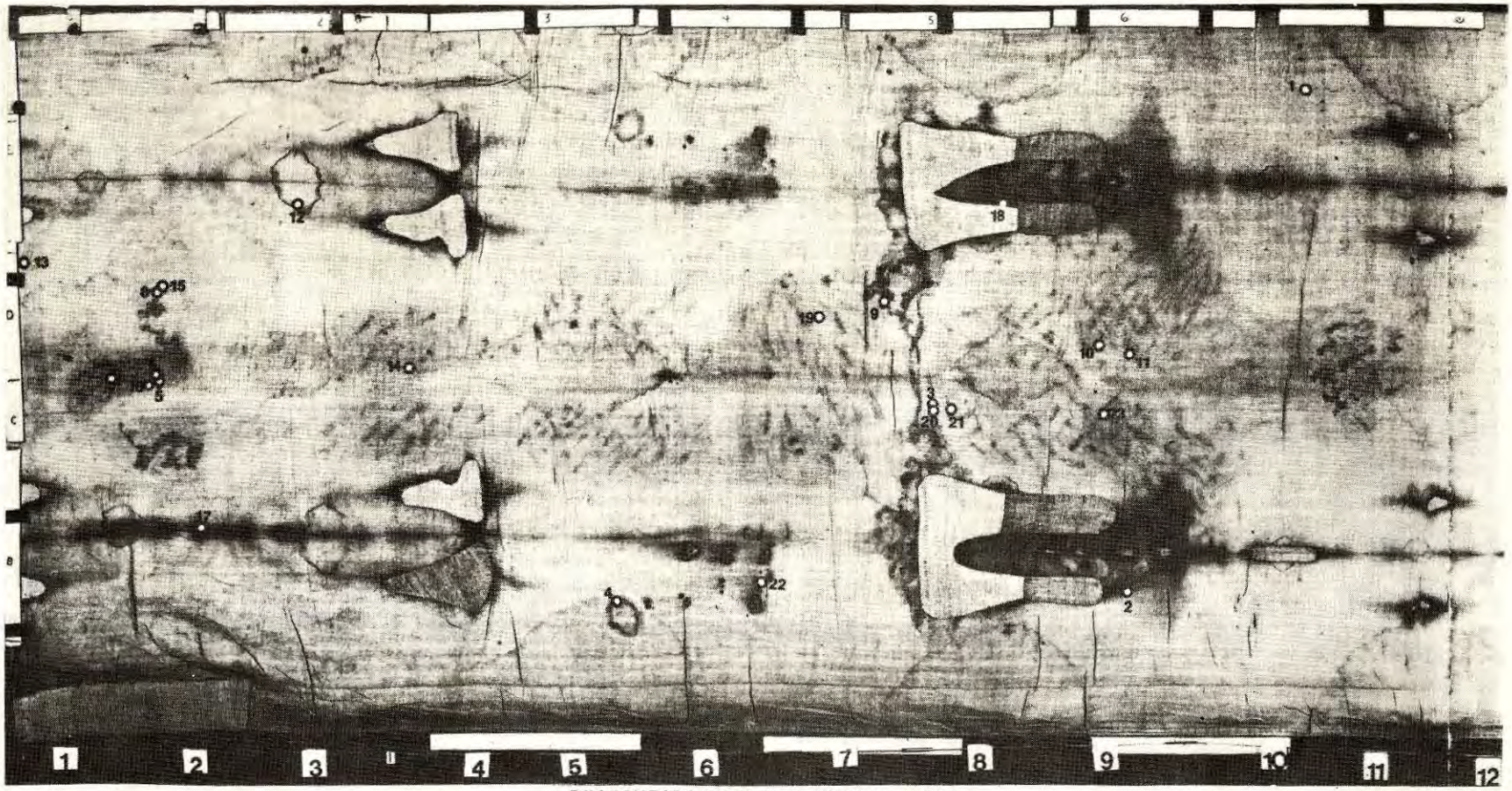

PHOTOMICROGRAPHY - DORSAL (7)

Map#	Description	Orig.Test Plan or (Rsrchr.Assgnd) ID#*	Slide File # Overall	C/U
1	Wax Stain	--	8-F-9	--
2	Light Scorch	--	8-I-8	--
3	Blood	--	8-I-8	--
4	Waterstain Margin	--	8-I-8	--
5	Image: "Dirty Heel"	1D	8-I-4	8-I-6
6	Image: Foot	--	9-H-4	--
7	Blood, Image: Foot	--	9-H-4	--
8	Blood Flow	1A	9-H-4	--
9	Blood	3C	9-H-6	--
10	Scourge Mark	--	9-H-6	--
11	Scourge Mark	--	9-H-6	--
12	Watermark at Margin	--	8-F-5	--
13	Rust Stain (from push-pin?)	--	8-F-5	--
14	Image: Back of Left Knee	--	8-F-5	
15	Blood Flow	1A	8-F-5	--
16	Image: Foot	--	8-F-5	--
17	Scorch	1C	8-F-5	--
18	Dark Scorch	--	8-F-7	--
19	Image: Body	--	8-F-7	--
20	Dense Blood	--	8-F-7	--
21	Image: Body	--	8-F-7	--
22	Burn Hole, Holland Cloth	--	8-F-7	--
23	Scourge Mark	--	8-F-7	--

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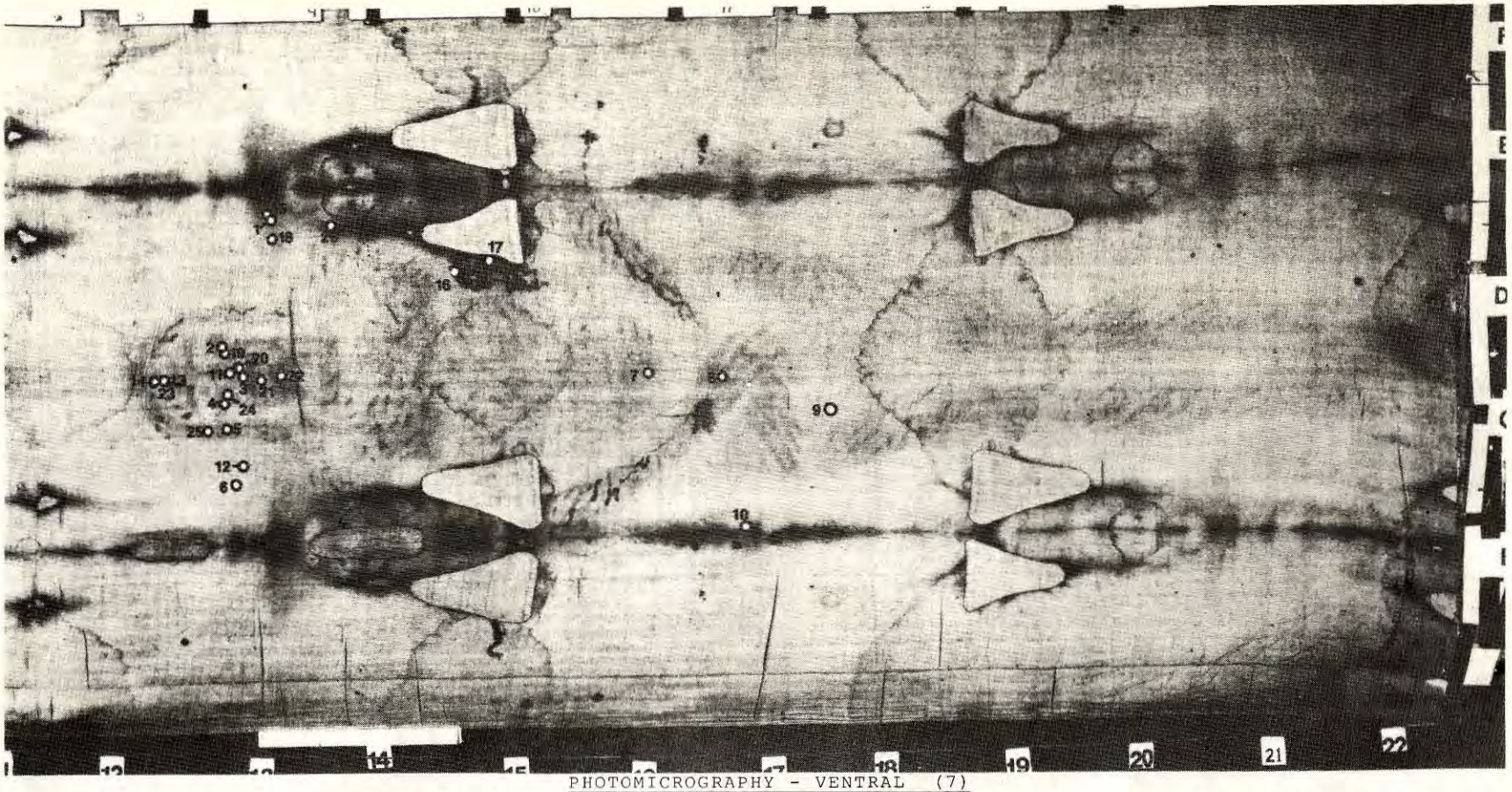

PHOTOMICROGRAPHY - VENTRAL (7)

Map#	Description	Orig.Test Plan or (Rsrchr.Assgnd) ID#*	Slide File # Overall	C/U
1	Light Scorch	7B	8-F-9	--
2	Image: Right Eye	8D	8-F-9	--
3	Image: Tip of Nose	--	8-F-9	--
4	Image: Left Eye/Cheek	--	8-F-9	--
5	Image: Hair, Blood	--	8-F-9	--
6	Control	8A	8-F-9	--
7	Image: Stomach	--	8-F-10	--
8	Image: Back of Hand	--	8-F-10	--
9	Image: Light Body	--	8-F-10	--
10	Light Scorch	--	8-F-10	
11	Image: Nose	--	9-G-5	--
12	Control	8A	9-G-5	--
13(&23)	Blood: #3 Mark Dark Area	8C	9-G-5	--
14	Image: Forehead	--	9-G-5	--
15	Light Scorch	7B(15)	9-H-9	--
16	Dark Blood, Image: Lance Entrance	6B(16)	9-H-9	--
17	Blood/Scorch Intersection	6A(17)	9-H-9	--
18	Control	(14)	9-H-9	--
19	Image: Right Cheek	8E(10)	9-H-9	--
20	Image: Nose	(9)	9-H-9	--
21	Image: Lips	(8)	9-H-9	--
22	Image: Chin	(13)	9-H-9	--
23(&13)	Blood: #3 Mark Dark Area	8C	9-H-9	--
24	Image: Left Cheek	(11)	9-H-9	--
25	Image: Hair, Blood	(12)	9-H-9	--
26	Light Scorch	--	9-B-3	--

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